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*Instruction Book*  
*for*

Transplanting  
*and*  
Managing

FRUITS AND  
ORNAMENTAL  
TREES, SHRUBS,  
VINES  
*and*  
FLOWERS

The  
National Nurseries

—  
Lawrence, Kansas

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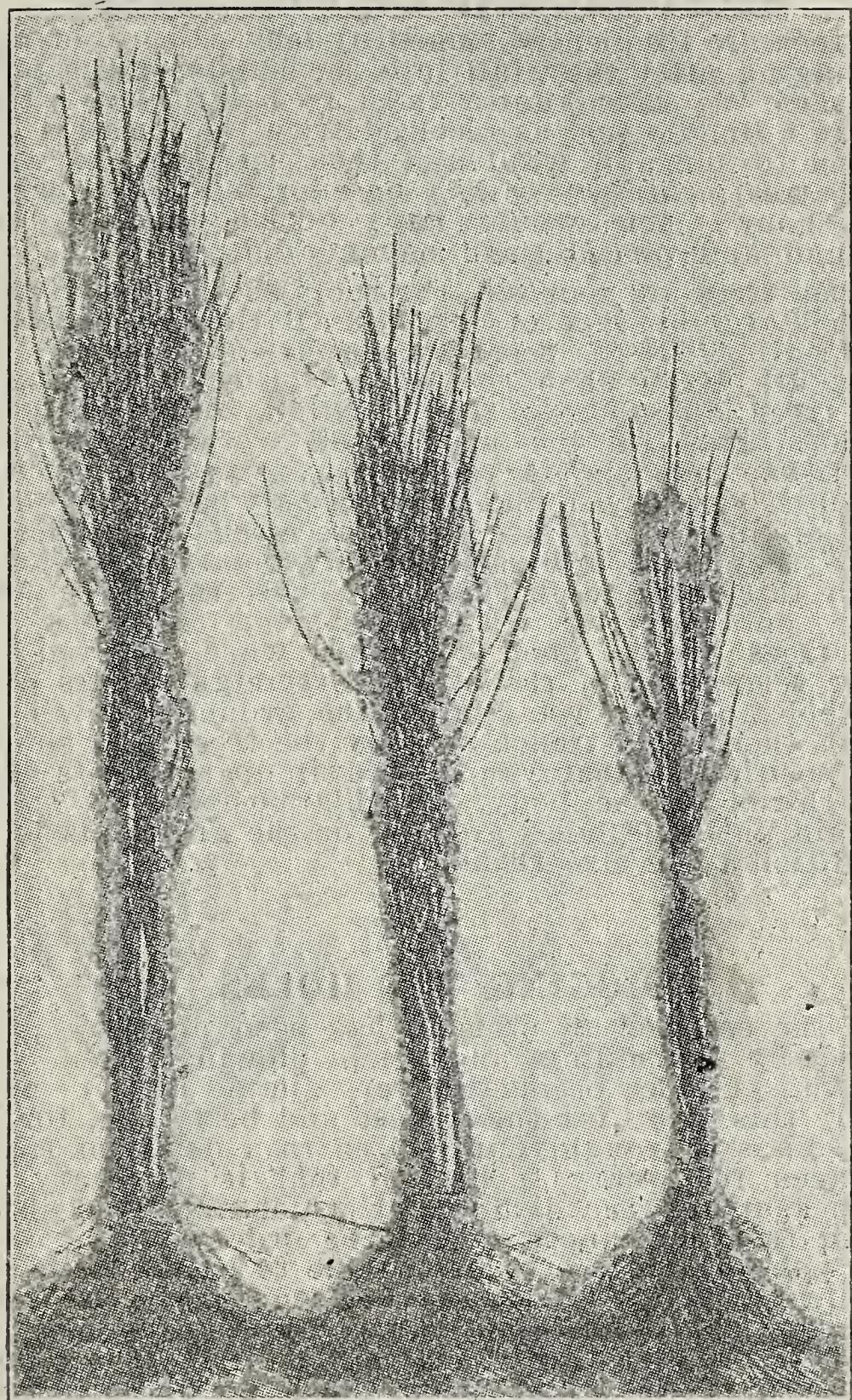
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NURSERY CATALOGS AND PRINTED SUPPLIES

DES MOINES, IOWA



## Our Trees are Well Rooted

### PREPARING THE GROUND.

Before planting fruit trees the soil should be made mellow by repeated plowing; and where the soil is densely packed, a subsoil plow should be used and the ground stirred up from eight to ten inches deep. If this is neglected the roots are soon surrounded by a strong wall and you cannot expect them to live many years. Wherever this system has been practiced, healthy vigorous trees and fine fruit has been the result.

## RECEIVING AND CARE OF TREES.

Trees are frequently ruined by lack of care, of bad managing after they fall into the hands of the purchaser. We have known them to lay for days tied up in a bundle just as received from the nursery, exposed to sun and wind and then set out, and with such treatment they cannot be expected to live when one hour's time would have buried them in the ground and placed them beyond danger.

When trees are received, the roots should be covered with a wet blanket or straw until they reach their destination. If the roots become dried from too long exposure, straw should be spread on the ground and the trees laid upon it, then cover the roots and tops with straw, and the whole well watered. In this condition they should remain for forty-eight hours, when they will be found as fresh as when first found in the nursery. If trees are received in a frozen state, they must be buried entirely, roots, top and all, from thirty-six to forty-eight hours, the earth will draw out the frost without injuring the trees. If the trees are in good condition when received or after remaining in the straw forty-eight hours and the holes are not yet dug, or the ground too wet to plant, then dig a trench and lay the trees in a slanting position so that you can cover up the roots and two-thirds of the body. In this position let them remain until the holes are dug or the ground is in a condition to receive them.

## DIGGING THE HOLES.

If the soil for an orchard has been properly prepared by subsoiling and deep plowing, then the opening of holes becomes a very simple matter; and really this is by far the easiest and best plan, for if the soil is thoroughly pulverized to a depth of from eighteen to twenty inches all that is necessary is to measure off the distance at which the trees shall stand from one another, and the order of planting: flag poles are to be set in the line to be occupied by the first row of trees, and a deep furrow is then opened with a large plow, drawn by a steady pair of horses. The poles are then moved and set for the next row of trees, and so on, until the whole is laid off, making the furrows as straight as possible. This done, a lighter plow, drawn by a single horse, is driven across these deep furrows, at the proper distances, so that the intersection shall indicate where the trees are to stand. A few shovelfuls of earth removed, and the hole is ready for the tree. If the furrows have not been recently made, it will be well always to remove a portion of the surface, so to have fresh soil next to the roots.

Where only a few trees are to be planted, and the soil has not been subsoiled, or where trees are to be planted in sod, then the holes ought to be at least four feet wide and twenty-four to thirty inches deep. the subsoil thrown back, and the holes filled up to a proper depth to receive the trees with a fine top soil.

## PRUNE BEFORE PLANTING.

Both root and top should be pruned at the time of planting and before the tree is set in the ground; the neglect of this causes the loss of an immense number of trees. When taken from the nursery the roots are more or less mutilated, therefore the balance of the trees must be restored by cutting off a portion of the side and top branches. First cut off the ends of all broken and bruised roots with a sharp knife, in a slanting direction, on the under side; this will cause the wound to heal over readily, by throwing out plenty of fibrous roots at the end; then cut back each branch or side limb to a bud not more than four or five inches above the highest side limb. Where there are no side limbs the tree should be headed back to a height proper to form a top. None of the lower limbs should be cut off entirely, as it is best to form the head as low down as possible, so that the limbs and leaves will protect the trunk of the trees from the direct rays of the sun.

Fig. 1.



Improperly Planted  
SURE TO DIE

Fig. 2.



Properly Planted  
WILL LIVE

## DEPTH TO PLANT.

All kinds of fruit trees should be planted from two to three inches deeper than they grew in the nursery.

## PLANTING

When ready to plant and before removing the trees from the trench, dig a hole about the size required for a tree; fill in to about six inches of the top with water; then fill it with fine soil and stir it into a pretty thick puddle. Take from the trench a few trees at a time, prune the roots and top as directed and place them in the puddle so that the roots are well covered; let them remain until the hole is ready and remove one by one as they are needed. Use good mellow top soil in the bottom of the hole and around the roots, slanting it a little to the southwest, leaving a little mound in the center of the hole; place the tree in position and arrange it to the proper depth by filling in or raking back the soil to or from where the tree will stand, then fill in fine, mellow soil between and around the roots with the hand, arranging all the roots in their natural position, and packing in the soil carefully around them. When the roots are barely covered, sprinkle on not less than a half bucket of water to moisten the soil and settle it among the roots; then fill to the top and press down the earth around the tree with the foot; throw a bucket of water around each tree to settle the ground, and scatter a little soil on top to prevent baking. Trees set out in this manner and well mulched will withstand almost any amount of drought.

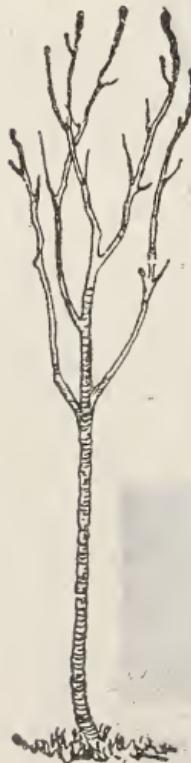


FIG. 1.

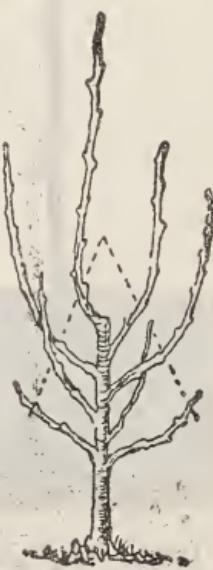


FIG. 2.

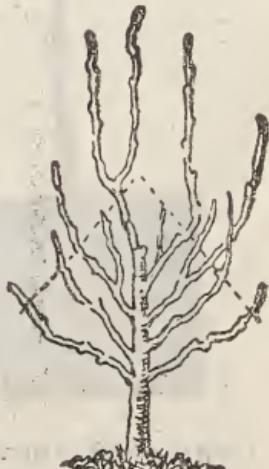


FIG. 3.

Figure 1 shows a standard apple or pear tree in the spring after it has grown one season. In pruning cut above a bud that is on the outside of a limb, as that bud will develop into a branch, growing outward, and it is desirable to have the growth of the tree spreading, in order to let in sunlight and air. If the limb is cut just above a bud on the inside, the future branch will grow toward the main stock.

Figure 2 is the two or three years' dwarf pear at the time of setting out. The dotted lines show where the branches should be cut off at the time of planting. This should be done without fail.

Figure 3 represents the tree after it has made its first summer's growth since planting. The dotted lines show where it should then be cut back. The same general course must be pursued for every pruning afterwards, retaining the pyramidal form. Prune any time from November to April, but prune every year.

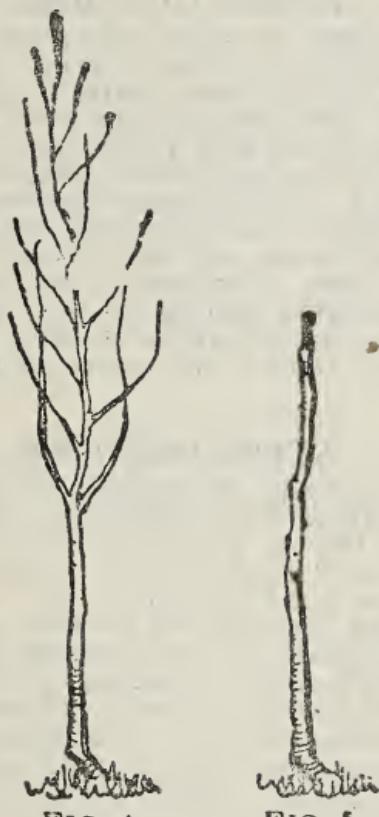


FIG. 4.

FIG. 5.

Figure 4 represents one of our peach trees as it is sent from the nursery.

Figure 5 shows how it should look when it is planted by the customer.

### MULCHING.

Mulching is of vital importance and should never be neglected; the material used every third year should be coarse stable manure, for intervening

years such material as straw, grass, hay, sawdust or tanbark; any of above to be spread around the tree for a space of from four to five feet and three to six inches deep. This mulch should be placed around the trees about December 1<sup>st</sup> each year, and left until about May 10th, when manure should be removed and if other materials are used it should be removed also, if the land is to be cultivated. Thorough cultivation is always best, but if the orchard cannot be cultivated the mulch material named above except manure should be left around the trees all summer, to hold moisture and keep down grass and weeds. The object of mulching in early winter is to keep the ground from thawing around the roots until late in spring. More trees die from alternate freezing and thawing of roots than from all other causes, and the mulch will carry the roots through in perfect condition, if enough is kept on.

## AFTER CULTURE.

The trees should be kept free from grass and orchard except potatoes, beans, peas, carrots or corn. Cultivate well in the early part of the summer and in the month of October. The principal of cultivation is that the loose and pulverized soil on the surface prevents the evaporation of moisture and keeps weeds in check. Give under drainage when it is needed, and attend annually and carefully to surface drainage. Bone dust, salt and plaster, are excellent manure for trees when used on the surface. No manure of any kind should be put in the hole with the tree; it is very injurious, causing a rank growth, making the tree tender and consequently short lived.

## AFTER PRUNING.

The great majority of people do not take proper care of their trees after planting. This is a great mistake. If a tree or vine does not receive the right kind of care, and enough of it when young, it will never attain to a healthy old age. Very much has been said about pruning by various authors. Judging from these and our own experience and observations, we would say: Looking at the health and vigor of a tree, the best time to prune is just before sap begins to run, early in the spring.

Summer pruning is done to check rank growth and promote fruitfulness. This should be done very cautiously, if at all, as too much pruning will harm the tree. When we are in a hurry to have a tree bear, we pinch off the bud on the end of the limbs a little in summer. Do not fear to prune the tree when it is young—that is, when it is not growing—and keep pruning as long as it lives.

## WATERING.

Trees seldom require watering, except in very dry weather. Probably more trees are killed than saved by injudicious watering. One good watering once a

week at night and repeated the next morning, is far better than ten times as often if improperly done. The right way is to draw away a little of the soil from the side of the tree, and allow all the water that the soil will absorb to soak in, then replace the dry soil. Repeat this the following morning.

### **STANDARD APPLE TREES**

should be planted twenty-five to thirty feet apart according to the nature of the soil and climate. In the South, it has been found of advantage to plant about twenty-five feet apart, and keep the heads low so as to protect the trunk from the direct rays of the sun. Plant out and cultivate as directed and do not neglect to mulch them, especially young trees.

The apple will grow on a great variety of soils, but it seldom thrives on very dry sand or soil saturated with moisture. Its favorite soil is a strong loam of limestone nature. A deep, strong, gravelly, marly or clayey loam, or a strong, sandy loam on a gravelly sub-soil, produces the greatest crops and the highest flavored fruit, as well as the utmost longevity of the trees. Such a soil is moist rather than dry, the most favorable conditions for this fruit. Too damp soil may be rendered fit for the apple by thorough drainage, and that which is too dry by deep sub-soil plowing or trenching, where the soil is of a heavy texture; and many New England orchards are very flourishing and productive on soils so stony and rock-covered as to be unfit for any other crop.

As regards site, apple or orchards as a rule do best on northern or northwestern slopes.

### **CRAB APPLES**

should be planted eighteen to twenty feet apart. They are very hardy and bear abundantly. The fruit is highly valuable for preserving and jelly and makes the finest cider known. Plant and cultivate as the apple.

### **STANDARD PEARS**

should be planted twenty to twenty-five feet apart. They are grown on stock imported from France, and will grow on almost any soil, provided the sub-soil is not too wet; whenever this is the case the ground should be thoroughly under drained. In very poor soil a moderate top dressing of manure, in the fall will be of advantage. When a tree is assailed by the blight, cut off the part affected several inches below all appearances of the disease. Prune as directed and mulch well.

The pear will do its best on a strong loam of moderate depth, on a dry sub-soil; yet it will adapt itself to as great a variety of soils as any fruit tree. But the pear should never be set in soil that is wet the greater portion of the year, and too rich soil will produce so rapid a growth that the tree will be more liable to blight, as the wood will be soft. Soil that is too light may be improved by trenching, if the sub-

soil is heavier, or by top-dressing with heavy muck and river mud if it is not heavy.

In a climate cold for the pear, or on a cold soil, it is advantageous to plant on a southern slope; but in the middle states, in warm soils, we do not consider decidedly southern exposures as good as rather cooler ones.

### STANDARD CHERRIES

should be planted sixteen to twenty feet apart. The soil best adapted to the cherry is a light loam on a gravelly or sandy sub soil, though it will do well in almost any situation not too wet. To insure a good growth, cherries should be well cut back for several successive seasons. In some portions of the West and South the cherry has not been uniformly successful, principally owing to an improper selection of sorts and the kind of trees. The great cause is owing to the body of the tree cracking, and becoming diseased, either dying outright or maintaining a sickly existence; particularly the Heart and Biggarreau classes. This is caused most by the direct action of the hot sun upon the unprotected trunk and large branches of the trees during rapid growth, and may be almost entirely remedied by planting dwarf cherries, cultivated on the Mahaleb stock, as the plants are rendered more hardy, and the lower branches start from the body of the tree within ten to fifteen inches of the ground.

### PLUMS

should be planted twelve to fourteen feet apart. A clay loam or heavy loam is best adapted to the plum. In such soil the tree is found to be more vigorous, healthy and productive than in light soils. Where trees are planted in very light soil, clay may be supplied to advantage. To prevent the destruction of the fruit by the curculio, the plan of jarring off the insects on sheets and destroying them, is the most sure and effective. This should be repeated twice a day during the early stages of the fruit. The best time is in the morning and evening when the dew is on.

Swamp muck is also excellent, especially that from salt water marshes. Common salt sprinkled about the trees will do them good. Plums do well when planted in a hen yard, or where the fowls have free access to the trees, as they will destroy the insects that trouble many varieties.

The Japanese varieties of plums should receive different treatment from the old varieties. When planted in the fall, they should stand unpruned until spring, then in early spring, just as the sap begins to move, head back three to five of the strongest branches, leaving about one-third of the previous season's growth and removing the balance of the limbs entirely. Then each ensuing spring head back at least one-half of the previous season's growth. The short spurs that may form on the bodies of the

limbs should not be removed, as they will develop fruit buds. When the trees are planted in the spring, they should be headed back at the time of planting.

## PRUNE TREES

should be planted ten to twelve feet apart. Soil and treatment same as plum.

## STANDARD PEACHES

should be planted sixteen to eighteen feet apart. To secure healthy, vigorous, and fruitful trees, and fine fruit, the following points must be well attended to: First, keep the ground clean and mellow; second, keep the heads low—the trunk should not exceed three feet in height; third, give them an occasional dressing of wood ashes; fourth, prune every spring, shortening the shoots of the previous year's growth. This keeps the head round, full and well furnished with bearing wood. Cut weak shoots back about one-half, and strong ones about one-third; but see that there is left a sufficient supply of fruit buds. Sickly and superfluous shoots should be cut out clean. The fruit is borne on branches of last season's growth, and hence the necessity of keeping up a good supply of vigorous annual shoots all over the tree. Salt is an excellent fertilizer for peach trees; soap suds also are good. Young trees should be well mulched every spring.

As regards the best soil for peaches, there is such a diversity of opinion among experienced growers that we shall necessarily conflict with some pet theories in advising our patrons, yet we think no one will regret following our advice. The very best soil for the peach is a rich, deep sandy loam; next to this is a strong, mellow loam; then a light, thin, sandy soil; and the poorest is a heavy, compact, clay soil. We are aware that the peach does well on the lightest sandy soil in New Jersey, Delaware and Maryland, but it will reach the greatest perfection and live the longest, in soil such as we have described.

In sections where the blossom is liable to be cut off by late spring frosts, we advise planting on the north side of hills, northern slopes or elevated grounds, in preference to warm valleys and southern aspects. The buds will not start so early, and will be less liable to injury by the frost.

If a heavy mulch is placed about the trees after the ground is frozen it will retard the growth in the early spring, and often insure a crop of peaches.

## APRICOTS AND NECTARINES

should be planted twelve to fifteen feet apart. They will grow on any friable soil under good culture. The apricots ripen about a month before our early peaches. The fruit is very fine, but like the plum is liable to attacks of the curculio, for which the same precaution and remedies should be applied. The nectarine is similar to the peach, both in fruit and

character of the tree, but its skin being smooth makes it subject to attacks of the curculio. The apricot and nectarine need the same management, culture and training as the peach. Not recommended for the north or middle west.

## QUINCES

should be planted ten to twelve feet apart.

The quince grows naturally in rather moist soil, by the side of streams of water; hence it is a common idea that it should always be planted in some damp, neglected part of the garden or farm, where it usually receives no care, and the fruit is often knotty and inferior.

While it will thrive in damp soil, no tree is more benefited by manuring and cultivation than the quince. In a rich, mellow, deep soil, even if quite dry, it grows with thrice its usual vigor, and bears abundant crops of large and handsome fruit. The quince should, therefore, be planted in deep and good soil, kept in constant cultivation, and it should have a top dressing of manure every season if the finest fruit is desired. Common salt, sown broadcast about the trees, is very beneficial.

## CURRANTS

should be planted in the garden four feet apart. Sawdust or tanbark should be used as mulch. The currant flourishes in almost every kind of soil, but to have the fruit in perfection, plant in rich, deep soil, and give good annual pruning and cultivation. When plants are grown as stools or bunches the older and feebler suckers should be cut out, such as crowd and over bear the plant. Of late years the currant worm has been very troublesome but if the bushes are sprayed with powdered white Hellebore, say a teaspoonful diluted in a pail of water, when the leaves are formed, also when the fruit is beginning to form, the currant worm will be disposed of.

## GOOSEBERRIES

should be planted the same distance apart as currants. The plants should be annually and rather severely pruned by thinning out all feeble and crowded branches. Mulch the same as currants.

The gooseberry loves a deep, rich, rather cool soil and situation, and a partial shade often proves favorable to it. In transplanting, follow directions given for currants. Gooseberries need no pruning at the time of transplanting. Liberal manuring, cultivating, and a mulch of coal ashes is useful and tends to prevent mildew, which is liable to injure some varieties. If mildew does appear, the crop can usually be saved by sprinkling sulphur or slacked lime upon the bushes and salt upon the ground.

## RASPBERRIES

should be planted four feet apart each way. In training, allow only a few canes to grow from each

plant, cutting away all suckers to throw the strength into the stalks for bearing; all old canes should be removed when the bearing season is over. Tender varieties should be protected during the winter in the northern states.

A good gravelly soil, or a deep, moist loam is generally considered best for the raspberry, yet the plants do well on light or even sandy loam, and on such soil the fruit will ripen some days earlier. The red varieties should not be placed on hard, clayey land, nor on low, wet soil. The black varieties do very well on clayey soil.

In field culture the plants are usually placed two and one-half or three feet apart. Then, if necessary the bushes of two adjoining hills can be tied together at the top, forming an arch which will render them self-supporting. When planting on a large scale, the plow can be used instead of the spade, for getting the ground in condition, and also for transplanting, as bushes can be planted in the furrows instead of making holes with the spade. Run the plow six or eight inches deep, then partially fill the furrow with well-rotted manure.

Newly set plants should be hoed or cultivated quite frequently, especially early in the season, as it is important that a good start should be obtained the first year; in fact, if the land is in good condition, frequent cultivation without manuring is better than manuring without cultivation. It is important that all weeds should be kept down the first as well as the following seasons. When the plow is used, it should be run quite shallow, so as not to injure the roots. Old stable manure is the best fertilizer for general use. On light soils it is well to apply it as a mulch. Well-rotted stable manure, or a mixture or spent tanbark and wood ashes, make a most excellent mulch. A little salt may be added to the mulch or fertilizer.

The first season only two or three shoots or canes should be allowed to grow from each root or hill. In midsummer, when the canes have reached a height of about two feet, the top should be pinched off with the thumb and finger. This will cause the canes to throw out laterals. These branches should likewise be cut back when they have made a growth of about one foot from the canes. If this summer pruning is neglected until the bushes get to be three or four feet high, shears should be used to cut them back to within two and one-half feet of the ground. It is not necessary to head in all varieties during the summer, and in garden culture some prefer driving a stake in each hill to which the bushes can be tied to keep them from dropping to the ground when fruiting. The bushes can be allowed to grow, and in the late fall the surplus suckers and the old fruit canes can be cut out, and the suckers that are left for the next year's crop cut back to within two and one-half feet of the ground.

## BLACKBERRIES

require the same kind of soil and treatment as raspberries, except that they should be planted in rows eight feet wide and four feet apart in the row. A neat and improved method of pruning will make the plants self-sustaining bushes, viz.: As soon as the plants are about four feet high, clip off the points of the growing canes and repeat the operation several times until they assume the form of a bush. If not pruned in this manner they require to be tied to a stake or wire trellis. Mulching is of great advantage to both raspberries and blackberries.

## GRAPES

if planted for fastening to a trellis or arbor, should be planted twelve feet apart; but if tied to stake, six feet apart. The holes should be dug not less than four feet wide and two feet deep. Burying bones under the roots makes the vines much more prolific, and the fruit of better quality. The bones should be put in the bottom of the hole and covered with fine soil, then pour in a little water to settle the dirt among the bones; then fill up with mellow soil to within five or six inches of the top; cut off the bruised and broken roots; straighten the roots to their natural position and cover with fine mellow soil about two inches, packing it carefully with the hand, then sprinkle on sufficient water to moisten the roots, fill up the hole and press down the dirt. A stake should be placed with each vine at the time of setting six or seven feet high. The first year train one shoot only up to the stake, pinching off all others, and also the latter or side shoots that appear during the first season; the following spring cut the vine down to within three or four buds of the ground.

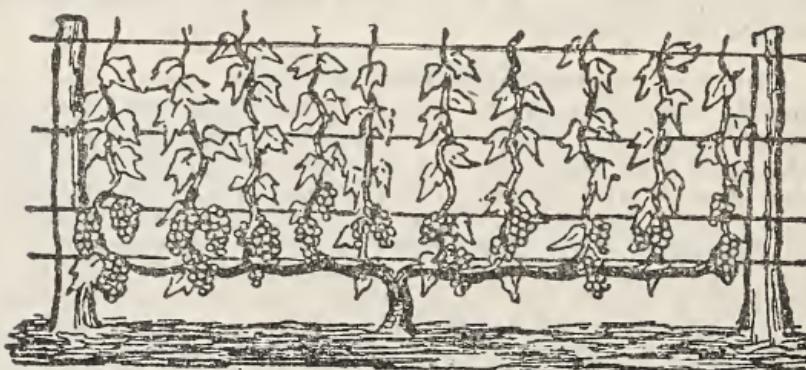


Fig. 6.

The next season allow but two of the strongest buds to throw out shoots. These, in the fall, will be from five to seven feet long and should be fastened to the lower part of the trellis. When growth com-

mences, pinch the buds so that the shoots will be from ten to twelve inches apart. As they grow train them perpendicularly to the second, third and fourth bars of the trellis, and in the fall the vine, with its fruit, will present the appearance shown in Figure 6, as no fruit should be allowed to set above the second bar of the trellis. During the season when the shoots shall have reached the upper bar of the trellis, they may be pinched to prevent further growth.



Fig. 7.

Late in the fall, cut back to two buds, as shown in Figure 7. The following spring allow but one bud to throw out a shoot, and treat as in the previous year. This system of pruning should be followed each year.

### STRAWBERRIES.

The ground should be prepared the same as for other crops; if not already rich, make it so by well rotted manure. Mark out the rows the desired width, and set plants ten to seventeen inches distant in the rows: if set twelve inches in rows four feet apart, an acre will require 10,890 plants; same as if set sixteen inches in rows three feet apart. In early winter when the ground is frozen, cover the whole with long straw, which should be removed from the plant in the spring but allowed to remain between the rows as a mulch to keep the berries clean next summer.

If all staminate varieties are planted each plant will fertilize itself and bear fruit, but when pistillate varieties are planted alone, they will never bear fruit. Therefore they must be planted not farther than four feet from a few of the staminate varieties to insure pollination to get the best results, plant all staminate varieties such as Bederwood, Senator Dunlap, Splendid, Lovett, Enhance, Capt. Jack Brandywine and Parker Early or alternate rows of staminate and pistillate varieties. By planting alternate rows of Bederwood, Senator Dunlap and Warfield the best results are produced in Minnesota generally.

### DEWBERRIES.

The dewberry, or trailing blackberry, should be trained to a stake, or it can be worked regularly on a small trellis. It should be planted in rows about six feet apart and four feet apart in the row. When the cane or vine has made a growth of five or six feet, it should be cut back. Otherwise treat the same as raspberries.

## ASPARAGUS.

To make an asparagus bed, prepare a place of fine, loamy soil, to which has been added a liberal dressing of rich manure. For a garden, set in rows, eighteen to twenty inches apart, with the plants ten to twelve inches apart in the rows. Make a small mound of the soil, over which the roots should be spread, then cover the plants with about three inches of soil. If planted in the fall the whole bed should be covered before winter sets in with two or three inches of coarse stable manure, which may be lightly forked in between the rows as soon as the ground softens in the spring.

## RHUBARB.

Deep, rich soil is the best for rhubarb, but it is such a strong vigorous-growing plant it will thrive almost anywhere. Set the roots so that the crowns are about an inch below the surface. It is a gross feeder; the more manure, the larger and finer the yield.

## EVERGREENS.

The holes ought to be dug four feet wide and two feet deep. Fill completely; let it remain until about the first of April. If set in up to the proper height with well-pulverized earth, mixed with about one-sixteenth of sand, cut off all the bruised and broken roots; place them in their natural position in the hole: cover them with rich, mellow soil, then pour on water until the roots are thoroughly wet; then fill to the top and pack with the foot.

After the tree is planted in the fall take long straw and set it entirely around the tree, and bind it at the top so as to cover the tree completely: let it remain until about the first of April. If set in the spring the straw covering should be put on just the same and remain about two weeks. During the first summer evergreens should be well mulched with coarse manure or litter, spread out a little beyond where the roots extend, and four to six inches in depth.

## ROSES.

Plant and treat in the same manner as evergreens. Shorten all the branches to about one-half their original length. Grass or weeds should never be allowed to grow within two feet of the stock and all old stocks should be trimmed out every fall. Cover with dirt about November 1st of each year to keep from freezing down.

## BULBS—OUT-DOOR CULTURE.

October and November is the proper time for planting Hyacinths, Crocuses, Tulips, Snowdrops and other bulbs, and not in the spring. Let the soil be dug to the depth of eighteen inches, thoroughly pulverized, and if the soil is poor, enrich with thor-

oughly decomposed manure; if the soil is too close or heavy, mix some sand with it and thoroughly incorporate the whole. When covered with half rotted manure this will sufficiently enrich the soil. The best covering is leaves or half decayed manure—never—rotten manure, as it excludes light and air. By excessive covering, many bulbs are annually lost. Cover then from two to four inches, after the ground is frozen two or three inches deep. This will help to secure the bulbs from the depredations of mice and other vermin. It is not the freezing that kills, but the continued thawing and freezing, thus lifting the bulbs to the surface of the ground. As soon as the coldest weather is over the covering may be removed. When the blooming season is past, pinch off all the flower stems allowing the bulbs to remain until the leaves are yellow. If the beds are wanted for bedding plants, take up the bulbs and re-plant them very thickly in any vacant spot, allowing them to remain until the foliage is decayed; then if named varieties, place each one in sand, putting them away until fall planting.

### HYACINTHS IN GLASSES.

Nothing more easy, more fragrant, or will more richly reward the grower than the Hyacinth. For pots and glasses the named varieties are the most desirable. To grow them in glasses the single ones are preferred, although some of the double are equally as good. First let your glasses be thoroughly cleaned, then fill them with water; the base of the bulb just and barely touching the water; place them carefully away for three or four weeks in a dark closet. Then you will find that the roots have nearly filled the glass; bring them to the light gradually. Avoid placing them on the window ledge, as the cold draughts chills the roots; neither expose to the full sun, but keep them in a room of moderate temperature, with plenty of light and air. As the water evaporates, fill up with water at the same temperature as the room. Never change the water unless it becomes tainted, neither use cotton or other fiddads. The simpler the treatment, the more certain of success.

### HYACINTHS IN POTS.

If the leaf mold, and special compost considered necessary for the amateur to grow these favorites to perfection is not available, take any ordinary garden soil; if poor, mix it with some thoroughly decomposed manure and fine sand; make a heap of it, turning it over once or twice. Select the deepest pots, plant one or more hyacinth in each, according to the size of the pot, place the bulb not deeper than the shoulder; thoroughly saturate them with water for two or three days, then place them in a box, covering the whole with six inches of damp sand and put them in a cold cellar placing them on the floor, leaving them there for at least four to six weeks, re-

moving them a few at a time to keep up a succession of bloom, bringing them gradually to the light. With the above simple treatment a lady last fall ventured upon what she termed "The deep waters" with hyacinths in glasses and hyacinths, crocuses and Duc Van Thol tulips grown in sand and moss—keeping them in darkness for the time specified. A most magnificent bloom of flowers was the result. The great secret is to obtain the bulbs well rooted, and this can only be accomplished by burying them in darkness. If exposed to the light at the first planting, the struggle between the top and the bottom growth, both particularly weak, commences, and the result is a weakly flower, if any.

### HERBACEOUS PAEONIES.

The best time to plant them is in the autumn. This is one of the finest herbaceous perennials, perfectly hardy, wonderfully showy and of the easiest culture. They will thrive in any ordinary garden soil needing no extra care or cultivation. The varieties from the earliest to the latest, afford a succession of bloom for over a month.

### LILIES

should be planted in November, five or six inches deep, and may be allowed to remain in the ground for years. These unlike the hyacinth, crocus, etc., if neglected in the fall, may be planted in the spring as soon as the garden is in condition to plant garden seeds.

### DAHLIAS

should be planted in the spring in mellow soil, as soon as all danger from frost has disappeared, and the ground is not too wet. In the fall or early winter, before frost, the roots should be taken up, packed in sand, and put away in a dry cellar or dark room, secure from frost.

### CLEMATIS VINES.

may be planted in the spring or fall. When planted in the fall they should be thoroughly mulched with half-rotten manure, allowing it to remain until after freezing weather is over in the spring. They can be planted two feet apart, allowing four or five different colors to run on the same frame or trellis. The ground should be made rich by using liquid manure, and pouring it around the vines as often as once a month during the growing season. After the blooming season is over in the fall the vines may be cut off near the ground, thus enabling them to throw out more and better shoots the following spring.

## PRIVET.

There are over forty varieties of the Privet family grown and disseminated in this country which leads to much confusion to the planter.

It will grow well in most all soils and locations even in the heart of large cities where other shrubs would perish on account of the smoke and gases. To get best results when planting in poor clay or hardpan soils, the trench should be dug out and ordinary good surface loam used in planting. A mulch of well-decomposed barn-yard litter is very beneficial to all hedges if applied annually in fall before severe freezing weather sets in.

The hedge can be planted in either single or double row.

If planting single row, dig trench 12 to 14 inches wide and of same depth, set plants from 8 to 12 inches apart according to size of plants.

If planting double row, dig trench 24 inches from each wall of trench, leaving 12 inches between rows and plant same distance apart as for single, only alternate. Thus:

Pack earth firmly around roots when planting and soak with water on completing.

If planted in spring, clip as soon as hedge is planted; do not let your courage fail you here. A safe rule is to cut off two-thirds of the tops; the more severe, the better for the hedge.

Do not clip your hedge in the fall.

Summer clipping should be done during the last half of June, to allow young wood to harden before winter sets in.

**Ligustrum Amuenthesis.**—This is the Amoor or Russian Privet and is the only variety that should be planted for hedging in the cold northern states. Of course, it will thrive and do well all over the country, but it must be remembered that for northern latitude this is the only variety that can be safely planted.

**Ligustrum Ovalifolium.**—This is California Privet. Planters must be careful not to get this variety confused with the hardy. The California Privet is one of the most beautiful varieties grown, but must be planted in the southern states.

## SPRAYING FRUIT TREES.

Experience has demonstrated the fact that spraying at the proper time and properly done for protection against destructive insects, rot, fungus and blight is the best if not the only sure remedy against these enemies of the horticulturist and that it has succeeded and will succeed is evidenced by the rapid increasing interest manifested in the manufacture, sale and use of spraying machines, and the good results obtained by those who have practiced this method of protection.

**Apple Trees.**—For prevention of leaf blight, spray as soon as the leaves open in the spring, with Bordeaux Mixture, or ammoniacal carbonate of copper. To destroy the aphis or plant lice, spray with kerosene emulsion as soon as the pest appears. To destroy the codling moth, canker worm and curculio, spray with Paris green or London purple,  $\frac{1}{4}$  pound in 40 or 50 gallons of water, soon after the blossoms fall, and again two weeks later. To destroy the web worm, spray with London purple or kerosene emulsion about August 1st to 10th, or as soon as they appear. This application should be made during the middle of the day, when the worms are out of the webs and feeding on the leaves.

**Cherries.**—Treatment same as recommended for the apples.

**Pears.**—The pear slug can easily be destroyed by spraying with Paris green, four ounces to 50 gallons of water, or kerosene emulsion as soon as it begins operations. Pear and quince blight can be destroyed by spraying with Bordeaux Mixture. The codling moth and curculio should be treated the same as recommended for apple trees.

**Plums.**—Destroy the aphis with kerosene emulsion through a fine spray nozzle. The curculio can be destroyed by spraying with 3 ounces Paris green to 40 gallons of water. First application should be made as soon as blossoms have fallen, and repeated at intervals of a week or ten days. Four applications should be sufficient. Other enemies of the plum will be destroyed by this method, but in all cases be particular to keep the poison and water constantly stirred.

**Grape Rot and Mildew.**—Use the Bordeaux Mixture.

## FORMULAS.

### Ammoniacal Copper Carbonate

Copper Carbonate .....	1 ounce
Ammonia enough to dissolve the copper	
Water .....	9 gallons

The copper carbonate is best dissolved in large bottles, when it will keep indefinitely, and it should be diluted with water as required. For the same purpose as Bordeaux mixture.

### Bordeaux Mixture

Copper sulphate .....	6 pounds
Quicklime .....	6 pounds
Water .....	50 gallons

Dissolve the copper sulphate by putting it in a bag of coarse cloth and hanging this in a vessel holding at least 4 gallons, so that it is just covered

by the water. Use an earthen or wooden vessel. Slack the lime in an equal amount of water. Then mix the two and add enough water to make 50 gallons. It is then ready for immediate use. Do not use Bordeaux mixture which has been made over 48 hours.

For the third spraying an increase of lime insures the safety of the mixture, that the foliage and the fruit may not be injured by the presence of dissolved copper. For rots, molds, mildew and all fungus diseases.

### Copper Sulphate Solution

Copper sulphate	.....	1 pound
Water	.....	15 gallons

Dissolve the copper sulphate in the water, when it is ready for use. This should never be applied to the foliage, but must be used before the buds break. For peaches and nectarines, use 25 gallons of water. For fungus diseases.

### Hellebore

Fresh White Hellebore	.....	1 ounce
Water	.....	3 gallons

Apply when thoroughly mixed. This poison is not so energetic as the arsenites and may be used a short time before the sprayed portions mature. For insects which chew.

### Kerosene Emulsion

Hard soap	.....	1/2 pound
Boiling Water	.....	1 gallon
Kerosene	.....	2 gallons

Dissolve the soap in the water, add the kerosene and churn with a pump for 5 to 10 minutes, then add 30 gallons of water. Use strong emulsions for all scale insects. For insects which suck, as plant lice, mealy bugs, red spider, thrips, cabbage worms, currant worms and all which have soft bodies, dilute the above formula before applying by adding 50 to 60 gallons of water.

### Paris Green

Paris Green	.....	1 pound
Water	.....	250—300 gallons

If this mixture is to be used on peach trees, 1 pound of quicklime should be added. Repeated applications will injure most foliage, unless lime is added. Paris Green and Bordeaux mixture can be applied together with perfect safety. Use at the rate of 4 ounces of arsenites to 50 gallons of the mixture. For insects which chew.

### RECIPES, ETC.

Dissolve two pounds of potash in two gallons of water, or with soft soap—apply to young trees with a soft brush. This is a good wash.

Leached wood ashes placed with soil around the body of peach trees is sure protection against the invasion of the peach borer.

To kill the rose bug and slug, sprinkle the bush with a mixture of whale oil soap and tobacco juice.

## PRUNING.

We will suppose that after the first year's growth, the branches were well cut back, as per our directions. Then, as soon as growth commences, numerous sprouts or shoots will start on each limb. All of these sprouts should be rubbed off, except the one nearest the end of the limb. When pruning, do not forget that the way a bud points is the direction the future limb will grow; so if you want the limb to grow outward prune so as to leave the last bud on the lower side: if desire an upward growth leave the last bud on top.

Many varieties of standard pears and plums require an annual headings-in as well as the removal of surplus limbs. Cherries and quinces require but little pruning, except to keep the tree in good shape. Dwarf pear and apricots require annual pruning. Peaches require severe annual pruning.

It is well to remember that pruning fruit trees is largely a matter of common sense, and that the object is to form a well shaped tree, to allow the sun and air to get at the fruit, and to check a too rapid wood growth, thereby throwing the sap into fruit buds. If the tree is growing tall and rampant, cut it back; if all the limbs grow inward, thin them out in such a manner that the remaining branches will make an outward growth, that the sun and air may be let in; if the branches droop too much, and give evidence of eventually preventing moving about under the trees, trim so the future growth will be upward; when a tree of bearing age is making a very rapid growth and does not fruit, cut it back severely.

## THE APPLE BORER

Bores into the trees at the surface of the ground. When this white grub is in the tree it may be picked out with a knife or punched to death in its hole by using a flexible wire. If the borers are not numerous and time is precious, then this may be omitted, but late in June the trunk of the tree should be washed down to the ground with a mixture of half a gallon of soft soap and a quarter of a pint of crude carbolic acid stirred into two gallons of warm water and afterwards two gallons of cold water added. Another easy plan is to mix an ounce of crude carbolic acid with a gallon of hot and strong soap suds and apply when cold in June and again the last of July. Other preventives are to wash the lower trunks of trees with a solution of half a pound of common potash to half a gallon of water in May or June, and the coal ashes mixed with wood ashes and heaped around the trees in May. Wood ashes, if applied alone very thick, might injure young trees. Air-slacked lime and soil are also good to heap up around the trees.

## WASHES.

All young trees are greatly benefited by an annual wash of strong soap suds or lye made from wood ashes, which should be applied early in the spring. The addition of a gill of carbolic acid to each gallon of wash is recommended. As the trees get larger, instead of the wash, wood ashes can be thrown through the trees, while the limbs are damp, with very good results. During the summer, if any disease develops itself on the tree, wash them with soap suds and carbolic acid, after carefully removing the effected portions.

## FERTILIZERS.

Wood ashes are unquestionably the best fertilizer for all kinds of fruit trees, but they will be benefited by the liberal use of most any well-rotted manure, and planters should bear in mind that it pays (both in the quality and quantity of the fruit) to fertilize fruit trees.

## THINNING OUT THE FRUIT.

Many varieties of apples, pears and peaches are naturally so productive that they set more fruit than the tree can properly mature. When this occurs it is highly important to pick off from one-fourth to one-half of the crop as soon as it fairly sets. Very young trees should not be allowed to bear too heavily.

## DISTANCES FOR PLANTING.

	Distance	No. per Acre.
Standard Apples .....	30 feet	49
Standard Pears and rapid growing Cherries .....	20 feet	109
Duke and Morello Cherries .....	18 feet	135
Standard Plums, Peaches, Apricots, Nectarines .....	18 feet	135
Quinces .....	10 feet	436
Pyramidal Apples, Pears, Cherries and Plums .....	12 feet	302
Dwarf Apples .....	8 feet	681
Dwarf Cherries, Duke and Morellos .....	10 feet	436
Grapes on trellises .....	8 feet	681
Grapes trained to stake .....	6 feet	1,210
Currants, Gooseberries and Raspberries .....	4 feet	2,722
Blackberries .....	6 feet	1,
Strawberries, in beds for family use .....	15 in. apart each	
Strawberries, in large quantities for market 3½ to 4 feet apart and 1 foot apart in the		

